

468
G326
Fasc., 154me
1913
ENT.

A. M. Candell. Purchased in 1920.

154^{me} FASCICULE

MEGALOPTERA

GENERA INSECTORUM

DIRIGÉS PAR

P. WYTSMAN

MEGALOPTERA

FAM. RAPIDIDÆ

by ESBEN PETERSEN

WITH 2 COLOURED PLATES

1913

PRIX : FR. 8.60

En vente chez V. VERTENEUIL & L. DESMET, Imprimeurs-Éditeurs, 60-62, rue T'Kint, BRUXELLES

Prospectus gratis et franco sur demande.

Direction scientifique : M. P. WYTSMAN, Zoologiste, Quatre-Bras, TERVUEREN (Belgique).

MEGALOPTERA

FAM. RAPIDIDÆ

MEGALOPTERA

FAM. RAPHDIDÆ

by ESSEN PETERSEN

WITH 2 COLOURED PLATES



THE *Raphididæ* are nearest allied to the *Sialidæ* and form together with this family the order *Megaloptera*, which order hitherto has been regarded as a group of the *Planipennia*.

From the *Sialidæ* the family may be known by the very long prothorax, which is nearly as long as the rest of the body, by the small wings with open nervatur and well-developed pterostigma, by the long ovipositor of the female, and by the terrestrial habits of the larvæ.

HISTORICAL NOTES

The family *Raphididæ* was established by Latreille in " *Considérations générales sur l'Ordre naturel des Animaux, etc.* ", 1810. In " *Monographia generis Rhaphidiæ* ", Vratislaviæ, 1843, Schneider described *Inocellia* as a sub-genus, which later on has got generic rank. The two genera, *Raphidia* and *Inocellia*, are still the only known in the family, although the number of species is growing larger. Here follows a list of the most important literature concerning the family :

Albarda :

Revision des Rhaphidides (Tijdschr. v. Ent. Vol. 34, p. 65-184, t. 2-11, 1891).

Banks :

A Synopsis, Catalogue, and Bibliography of the Neuropteroid Insects of temperate North America (Trans. Amer. Ent. Soc. Vol. 19, p. 327-374, 1892).

Some Mexican Neuroptera (Proc. Cal. Acad. Sc. (2), Vol. 5, p. 515-522, 1895).

Neuropteroid Insects from Arizona (Proc. Ent. Soc. Wash. Vol. 5, p. 237-245, 1903).

Descriptions of new Nearctic Neuropteroid Insects (Trans. Amer. Ent. Soc. Vol. 32, p. 1-20, t. 1, 2, 1905).

Catalogue of the Neuropteroid Insects (except Odonata) of the United States, Philadelphia, 1907.

Descriptions of new Species of North American Neuropteroid Insects (Trans. Amer. Ent. Soc. Vol. 37, p. 335-360, t. 11, 12, 13, 1911).

Burmeister :

Handbuch der Entomologie, Vol. 2, 1839.

Brauer :

Neuroptera Austriaca, Wien, 1857.

Die Neuropteren Europas und insbesondere Oesterreichs, etc. Wien, 1876.

Costa :

Fauna di Regno di Napoli. Neurotteri. Rafidiidei. Napoli, 1885.

Curtis :

British Entomology, Vol. 1, 1824.

Girard :

Considérations générales sur le genre Raphidia (Ann. Soc. Ent. France, Vol. 4, p. 669-675, 1864).

Traité élémentaire d'Entomologie, Vol. 2, Paris, 1876 (Raphidiens, p. 491-506).

Guérin-Ménéville :

Observations sur la nymphe agile de Raphidia (Ann. Soc. Ent. France, Vol. 3, p. 34, 1845).

Fabricius :

Entomologia Systema, Vol. 2, Hafniæ, 1792; Suppl. ibidem, 1798.

Mantissa Insectorum, Vol. 1, Hafniæ, 1787.

Species Insectorum, etc., Hamburg et Kiel, 1781.

Systema Entomologiæ, etc. Flensburg et Leipzig, 1775.

Hagen :

Notes on the Genus Raphidia (Trans. Ent. Soc. Lond. Vol. 5, p. 493-499, 1867).

Synopsis of the Neuroptera of North America, Washington, 1861.

Die neueren Arbeiten über das Genus Raphidia, Linn. (Stett. Ent. Zeit. p. 180-186, 1844).

Vergleichung der von Rambur in seiner « Histoire Nat. des Ins. Neuropt. », p. 436-440, beschriebenen Arten der Gattung Raphidia, etc. (Stett. Ent. Zeit. p. 250-256, 1845).

Klapálek :

Description of a new species of Raphidia, L., and of three new species of Trichoptera from the Balkan Peninsula, etc. (Trans. Ent. Soc. Lond. p. 489-495, 1894).

Bemerkungen über die Trichopteren — und Neuropteren — Fauna Ungarns (Természetrájsi Füzetek, Vol. 22, p. 429-443, t. 18, 19, 1899).

Ueber neue und wenig bekannte Arten der paläarktischen Neuropteroiden (Bull. intern. de l'Acad. des Sciences de Bohême, p. 1-14, 1901).

Kirby & Spence :

Introduction to Entomology, London, 1822-1828.

Latreille :

Considérations générales sur l'Ordre naturel des Animaux, etc., Paris, 1810.

Genera Crustaceorum et Insectorum, etc., Paris, 1807.

Histoire naturelle, générale et particulière des Crustacés et des Insectes, Paris, 1810-1811.

Observation sur la Raphidia ophiopsis (Bull. Soc. Philom. Paris, Vol. 1, p. 153-154, 1798).

Linné :

Fauna suecica, Stockholm, 1746.

Systema Naturæ, ed. 12, Stockholm, 1767.

Mac Lachlan :

A Monograph of the British Neuroptera-Planipennia (Trans. Ent. Soc. Lond. p. 145-224, 1868).

A Sketch of our present knowledge of the Neuropterous Fauna of Japan (Trans. Ent. Soc. Lond. p. 167-190, 1875).

Raphidia cognata, Rambur, as a British insect (Ent. Monthl. Mag. Lond. Vol. 26, p. 304, 1890).

Mjöberg :

Svensk Insektfauna. Neuroptera. Planipennia (Ent. Tidskr., Stockholm, p. 129-162, 1909).

Meyer-Dür :

Die Neuropteren-Fauna der Schweiz. (Mittheil. Schweiz. Ent. Ges. Bd. 4, p. 281-436, 1874).

L. Navas :

Les Rhaphidides du Musée de Paris (Ann. Soc. Scientif. Bruxelles, 1909).

Neurópteros de España y Portugal (Brotéria, Série Zoologica, Vol. 5, 6, 7, p. 272-274, 1906-08).

E. Petersen :

Neuroptera Danica. Planipennia (Ent. Medd. Köbenhavn, p. 21-49, 1906).

A few new Neuroptera Planipennia (Ent. Mitteil., Berlin, p. 267-273, 1912).

Notes concerning Neuroptera from Caucasus (Mitteil. Kaukas. Mus. Tiflis, Bd. 7, p. 1-8, 1913).

M. Ed. Pictet :

Synopsis des Névroptères d'Espagne, Genève, 1865.

Percheron :

Mémoire sur les Raphidies (Guérin, Mag. Zool, Vol. 3, 1833).

Rossi :

Fauna Etrusca, etc. Vol. 2, 1807.

O. M. Reuter :

Neuroptera Fennica. Förteckning och Beskrifning öfver Finlands Neuropterer (Acta Soc. pro Fauna et Flora Fennica, Bd. 9, 1894).

Rostock :

Neuroptera germanica. Die Netzflügler Deutschlands, Zwickau, 1888.

Ratzeburg :

Die Forstinsekten, Bd. 3, Berlin, 1844.

Rambur :

Histoire naturelle des Insectes. Névroptères, Paris, 1842.

Schummel :

Versuch einer genauen Beschreibung der in Schlesien einheim. Arten der Gattung *Raphidia* Linné, Breslau, 1832.

Stein :

Entwicklungsgeschichte mehrerer Insectengattungen aus der Ordnung der Neuroptera (Wiegmann. Archiv f. Naturg. Vol. 4, p. 315, 333, 1838).

Beitrag zur Neuropteren-Fauna Griechenlands (mit Berücksichtigung dalmatinischer Arten). (Berl. Ent. Zeitschr. Bd. 7, p. 411-422, 1863).

Schneider :

Monographia generis *Rhaphidiæ*, Vratislaviæ, p. 1-99, t. 1-7, 1843.

Stephens :

Illustrations of British Entomology, etc. London, Vol. 6, 1836.

Schock :

Neuroptera Helvetiæ. Planipennia, Schaffhausen, 1885.

Schöyen :

Fortegnelse over de i Norge hidtil observerede Neuroptera Planipennia og Pseudo-Neuroptera (Christ. Vidensk. Forhandl. N° 13, 1887).

Wallengren :

Skandinaviens Neuroptera. Neuroptera Planipennia (Kongl. Svensk. Vetensk. Akad. Handl. Bd. 9, Stockholm, 1871).

Waterhouse :

Description of the larva and pupa of *Raphidia ophiopsis* (Trans. Ent. Soc. Lond. Vol. 1, p. 23, 27, 1834).

Zetterstedt :

Insecta Lapponica, Leipzig, 1840.

Imago. — Head elongate, contracted behind. Antennæ slender, filiform and nearly as long as the head and prothorax together; the basal joint very large, the second smaller but larger than the rest. Vertex nearly plane. Eyes prominent; ocelli present in *Raphidia*, but absent in *Inocellia*. Clypeus transverse, almost four times broader than long and with the front angles rounded. Labrum small, nearly quadrate. Mandibles (Pl. I, Fig. A b) curved towards the tip and with two teeth on the inner side. Maxillæ (Pl. I, Fig. A c) short and broad with a two-jointed maxillary lobe and with a four-jointed maxillary palpus. Labium (Pl. I, Fig. A a) longer than broad; labial palpi three-jointed, the third joint is the longest. Prothorax sub-cylindrical, long, much narrower than the head, dilated posteriorly. The prosternum in the genus *Raphidia* only visible at the posterior end, the rest concealed by the sides of prothorax. Meso- and metathorax almost equal, transverse and broader than the prothorax.

Wings hyaline, nearly of the same shape and size; the forewing the largest. The nervation mostly similar in both pairs and very open. The costal area dilated in the middle, especially in the forewings;

the cross veins simple. The subcosta reaches the margin before the pterostigma. Radius running parallel with the subcosta to the apex, where it is usually ending in one or more furcations. In the subcostal area one or two cross veins are present in the forewing, one or none in the hindwing. Pterostigma more or less coloured, very conspicuous, circumscribed by a cross vein on each side, and in the genus *Raphidia* with one or more cross veins in the area. The radial sector furcates very soon, and the branches are forked, some twice, towards the apical margin. The bases of the radius and the media are fused for some distance, and before the middle of the wing the media furcates; its two branches emit forks to the hind margin, and these forks are again forked as in the radial sector. The cubitus is starting directly from the base of the wing and furcates soon after, especially in the hindwing. In the forewing the first cubital branch and the media are fused for a short distance; in the hindwing the first cubital branch is free, but the second fuses with the first anal vein through the middle third of its course. Besides the above mentioned cross veins a few more are present, and thereby are formed cellules, some of which are of specific value. Here shall be mentioned those which are placed between the radius and the radial sector. In *insularis* and *Ratzburgi* the number of these is three, in the other species of *Raphidia* only two. Between the pterostigma and the first branch of the media are found three cellules in the greater part of species, f. inst. in *insularis*, but in some the number is four. In the forewing is lying a row of cellules under the media and its first branch, the number of which is three in the greater part of species, reckoned from the place, where the media and the first cubital branch are separated; in a few species there are four cellules, and in the genus *Inocellia* there are two rows. The place and length of the pterostigma in proportion to the below placed cellule is of specific value, likewise the colour of the pterostigma and the number and shape of cross veins in its area, but it may be remembered that the nervation of wings is liable to vary, and therefore no hasty conclusion should be formed from single specimens presenting unusual characters in this respect.

Legs are of moderate size; tarsi five-jointed; the third cordate and nearly concealing the fourth, which is the smallest. Claws with a broad basal part and with a much narrower, strongly curved, apical part.

Abdomen slender in the male, robust in the female; it is formed of nine segments, of which the eighth and ninth ventrally are cleft in the male to admit the insertion of the anal appendages (Pl. I, Figs. Ca, Cb). The penis (Pl. I, Figs. Da, Db) is generally narrow at the base, dilated in the middle and furcated at the apex. The female is furnished with a very long and flexile ovipositor (Pl. I, Fig. Cc), composed of two transversally striated divisions.

Larva (Pl. 2, Fig. 8) long and slender. Head elongate, subquadrate. Antennæ three-jointed. The mouth parts (Pl. I, Figs. Ea, Eb, Ec) nearly as in the imago. Prothorax elongate, subquadrate and almost of same length as the head. Meso- and metathorax shorter and broader than prothorax. Legs short, tarsi two-jointed and with simple claws. Abdomen long, broadest in the middle.

The **Pupa** (Pl. 2, Fig. 9) has much likeness to the imago, and the sex is indicated.

Biology. — The imagines and larvæ are carnivorous. The larvæ live beneath bark of trees, especially coniferous trees, and feed on small insects and larvæ frequenting such places. The pupa lives in a cell formed by the larva. After the lapse of some short time it emerges from this cell, and travels until it finds a favourable place, where it remains, till the emergence of the imago takes place.

Geographical distribution of the species. — The species of *Raphididæ* are found in the palæ- and nearctic regions, one species however is found in the neotropic region.

TABLE OF GENERA

1. *Three ocelli. Prosternum mostly concealed by the sides of the prothorax. Pterostigma divided by one or more cross veins.* 1. Genus *RAPHIDIA*, Linné.
(Type: *R. ophiopsis*, Linné).
2. *No ocelli. Prosternum free. Pterostigma without cross veins.* 2. Genus *INOCELLIA*, Schneider.
(Type: *I. crassicornis*, Schneider).

I. GENUS *RAPHIDIA*, LINNÉ

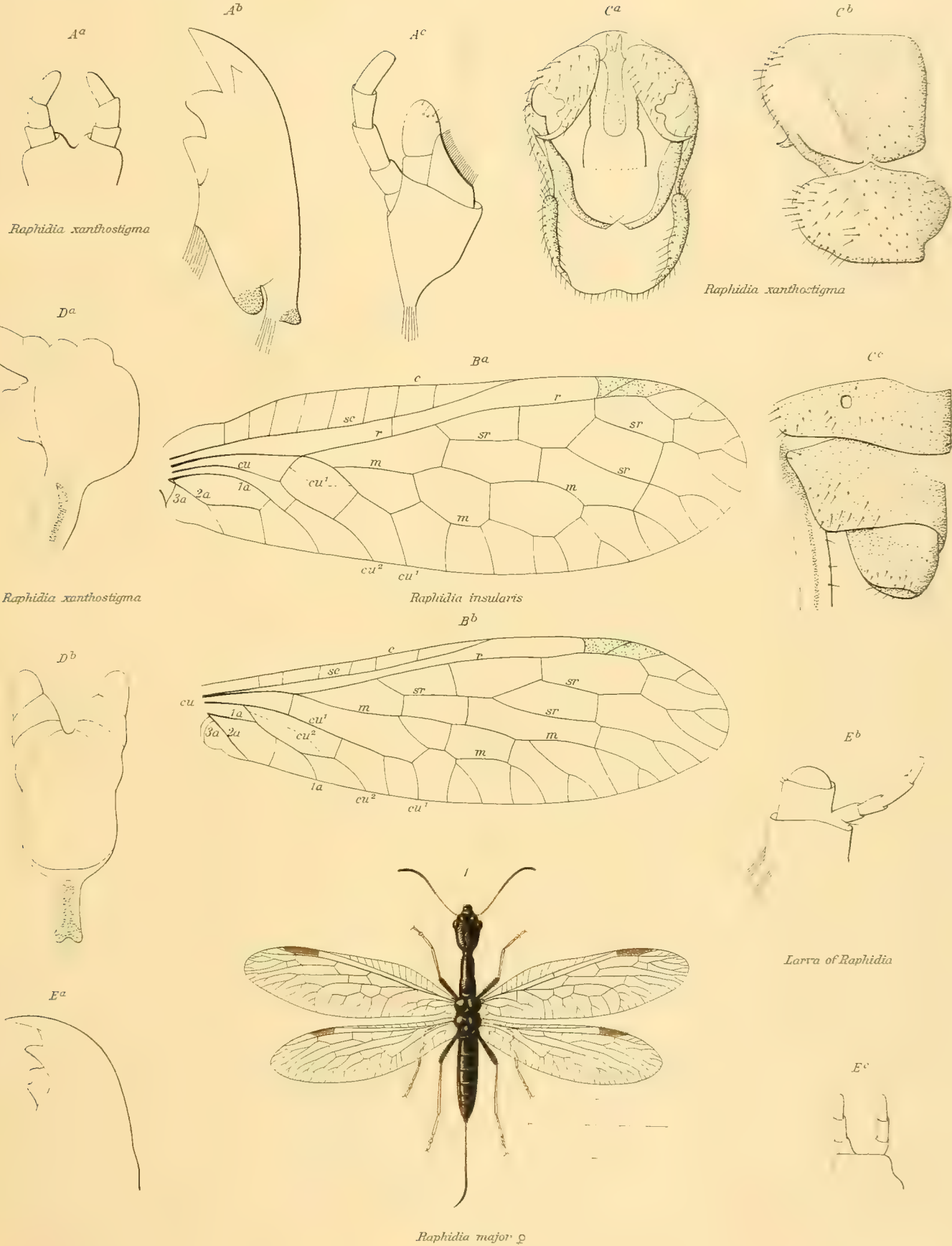
Raphidia. Linné, Syst. Nat. (ed. 1) (1735).

Rhaphidia. Burmeister, Handb. Ent., Bd. 2 (1839).

Characters. — Three ocelli. The sides of prothorax closing over the prosternum, and leaving the latter free in a limited space at the posterior end. The greater part of nervures, running to the apical and hind margin of wings, are forked there. Pterostigma divided by one to three cross veins. Only one row of cellules under the upper branch of media. The genitalia of male projecting. The descriptions of the five species, *armeniaca*, *corsica*, *bavaria*, *cyprica* and *taurica*, given by Hagen, are very short and uncomplete; he only gives descriptions of the appendices anales, and he does not give other informations as to localities than those, which the names of species indicate.

PALEARCTIC SPECIES

1. *R. adanana*, Albarda (1891). Asia Minor, Beyroot, Akbès.
Raphidia adanana, ♀, Albarda, Tijdschr. v. Ent. Vol. 34, p. 138, pl. 7, fig. 20 (1891).
Raphidia adanana, ♂, Navás, Ann. Soc. Scientif. Brux., p. 4 (sep.) (1909).
2. *R. Aloysiana*, Costa (1855). — **Pl. 2, Fig. 12.** Italy.
Raphidia Aloysiana, ♀, Costa, Fauna Regno di Napoli, Raphidiidei, p. 4, pl. 12, fig. 3 (1855).
Rhaphidia Aloysiana (Costa), Albarda, Tijdschr. v. Ent. Vol. 34, p. 133, pl. 7, fig. 18 (1891).
3. *R. armeniaca*, Hagen (1867). ?
Raphidia armeniaca, Hagen, Trans. Ent. Soc. Lond. Vol. 5, p. 497 (1867).
4. *R. bavaria*, Hagen (1867). ?
Raphidia bavaria, Hagen, Trans. Ent. Soc. Lond. Vol. 5, p. 497 (1867).
5. *R. baetica*, Rambur (1842). — **Pl. 2, Fig. 6.** Spain.
Raphidia baetica, Rambur, Hist. natur. Insectes, Névroptères, p. 437 (1842).
Raphidia baetica (Rambur), Pictet, Névropt. d'Espagne, p. 54, pl. 5, fig. 10 et 12 (nec fig. 13 et 15) (1865).
Rhaphidia baetica (Rambur), Albarda, Tijdschr. v. Ent. Vol. 34, p. 127, pl. 6, fig. 16 (1891).
6. *R. caucasica*, Petersen (1913). Caucasus.
Raphidia caucasica, Petersen, Mitteil. Kaukas. Mus. Bd. 7, p. 8, fig. 1 & 2 (1913).
7. *R. cognata*, Rambur (1842). England, Holland, Belgium, France, Spain, Corsica, Italy, Carinthia, Dalmatia.
Raphidia cognata, Rambur, Hist. natur. Insectes, Névroptères, p. 438 (1842).
Raphidia cognata (Rambur), Pictet, Névropt. d'Espagne, p. 53 (nec pl. 5, fig. 7-9) (1865).
Raphidia cognata (Rambur), Hagen, Trans. Ent. Soc. Lond. Vol. 5, p. 497 (1867).
Raphidia cognata (Rambur), Mac Lachlan, Brit. Neuroptera-Planipennia, p. 159, pl. 9, fig. 1 (1868).
Rhaphidia cognata (Rambur), Meyer-Dür, Neuropt. d. Schweiz, p. 356 (1875).

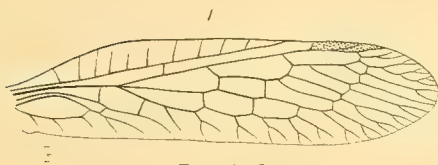




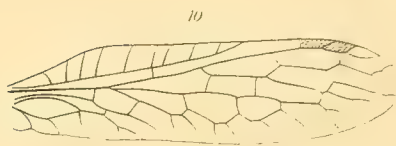
R. ophiopsis



R. flavipes



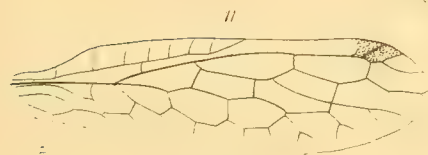
R. assimilis



R. maculicollis



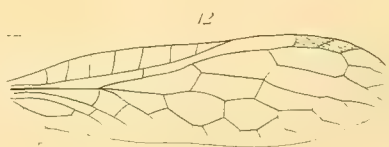
Raphidia notata ♂



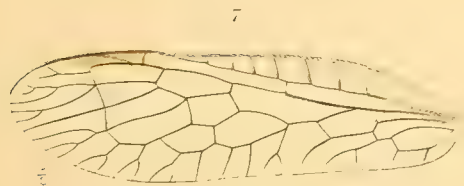
R. distincta



Inocellia crassicornis ♀



R. aloysiana



R. oblita



R. baetica

FAM. RAPHDIDÆ

- Rhaphidia cognata* (Rambur), Albarda, Tijdschr. v. Ent. Vol. 34, p. 135, pl. 7, fig. 19 (1891).
- Rhaphidia affinis*, Stephens (ex parte), Ill. Brit. Ent. Vol. 5, p. 131 (1836).
- Rhaphidia confinis*, ♂, Stephens, ibidem.
- Rhaphidia xanthostigma*, Schneider, Monogr. gen. Raphid., pl. 3, fig. a et d (1843).
- Rhaphidia colubroides*, Costa, Fauna Nap. Neur. Rafid., p. 5, pl. 12, fig. 4 (1855).
8. *R. corsica*, Hagen (1867). ?
Rhaphidia corsica, Hagen, Trans. Ent. Soc. Lond. Vol. 5, p. 496 (1867).
9. *R. cyprica*, Hagen (1867). ?
Rhaphidia cyprica, Hagen, Trans. Ent. Soc. Lond. Vol. 5, p. 498 (1867).
10. *R. etrusca*, Albarda (1891). Italy.
Rhaphidia etrusca, Albarda, Tijdschr. v. Ent. Vol. 34, p. 113, pl. 5, fig. 10 (1891).
11. *R. flavipes*, Stein (1863) — **Pl. 2, Fig. 5.** Germany, Bohemia, Austria, Hungaria, Switzerland, Sicily, Balkan peninsula, Asia Minor.
Rhaphidia flavipes, Stein, Berl. Ent. Zeitschr. Vol. 7, p. 416 (1863).
Rhaphidia flavipes (Stein), Albarda, Tijdschr. v. Ent. Vol. 34, p. 110, pl. 4, fig. 9 (1891).
Rhaphidia flavipes (Stein), Klapálek, Természettajzi Füzetek, Vol. 22, p. 439 (1899).
Rhaphidia ophiopsis, var. e, Schummel, Versuch, etc., p. 11 (1832).
Rhaphidia affinis, Schneider, Monog. gen. Raphid. etc. p. 73, pl. 3, fig. f et g (nec Stephens) (1843).
Rhaphidia affinis (Schneider), Hagen, Trans. Ent. Soc. Lond. Vol. 5, p. 496 (1867).
Rhaphidia affinis (Schneider), Brauer, Neuropt. Europa's, p. 15 (1876).
Rhaphidia affinis (Schneider), Rostock, Neuropt. Germ., p. 113 (1888).
Rhaphidia baetica, Brauer & Löw, Neuropt. Austr., p. 53 (nec Rambur) (1857).
Rhaphidia baetica, Meyer-Dür, Neuropt. Schweiz, p. 356 (1875).
12. *R. Harmandi*, Navás (1909). Japan.
Rhaphidia Harmandi, Navás, Ann. Soc. Scientif. Brux., p. 2 (sep.), fig. 1 (1909).
13. *R. insularis*, Albarda (1891). — **Pl. 1, Figs. Ba & Bb.** Sicily, Corsica.
Rhaphidia insularis, Albarda, Tijdschr. v. Ent. Vol. 34, p. 117, pl. 5, fig. 12 (1891).
Rhaphidia insularis, Petersen, Ent. Medd. Köbenh. Bd. 10, p. 26 (1913).
14. *R. ligurica*, Albarda (1891). Italy.
Rhaphidia ligurica, ♂, Albarda, Tijdschr. v. Ent. Vol. 34, p. 140, pl. 8, fig. 21 (1891).
15. *R. longicauda*, Stein (1863). Greece.
Rhaphidia longicauda, ♀ Stein, Berl. Ent. Zeitschr. Vol. 7, p. 416 (1863).
Rhaphidia longicauda (Stein), Albarda, Tijdschr. v. Ent. Vol. 34, p. 98, pl. 3, fig. 4 (1891).
Rhaphidia longicauda, ♂, (Stein), Klapálek, Bull. intern. Acad. Scienc. Bohême (1901).
16. *R. maculicollis*, Stephens (1836). — **Pl. 2, Fig. 10.** England, Holland, Belgium, Spain, Portugal, Algiers.
Rhaphidia maculicollis, Stephens, Ill. Brit. Ent. Vol. 6, p. 131 (1836).
Rhaphidia maculicollis (Stephens), Mac Lachlan, Brit. Neur. Plan., p. 160, pl. 9, fig. 2 (1868).
Rhaphidia maculicollis (Stephens), Navás, Ann. Soc. Scientif. Brux., p. 4 (sep.) (1909).
Rhaphidia maculicollis (Stephens), Albarda, Tijdschr. v. Ent. Vol. 34, p. 124, pl. 6, fig. 15 (1891).
Rhaphidia affinis, Stephens, l. c. (ex parte).
Rhaphidia hispanica, Rambur, Hist. natur. Insectes Névropt. p. 438 (1842).
Rhaphidia hispanica (Rambur), Schneider, Stett. Ent. Zeitschr. p. 255 (1845).
Rhaphidia hispanica (Rambur), Pictet, Névropt. Espagne, p. 52, pl. 5, fig. 1-6 (1865).
Rhaphidia hispanica (Rambur), Hagen, Trans. Ent. Soc. Lond. Vol. 5, p. 496 (1867).
17. *R. major*, Burmeister (1839). — **Pl. 1, Fig. 1.** North, Central & East Europe.
Rhaphidia major, Burmeister, Handb. Ent. Vol. 2, p. 964 (1839).
Rhaphidia major (Burmeister), Schneider, Monogr. gen. Rhaphid. p. 79, pl. 4, fig. g, h et i (1843).

Rhaphidia major, Burmeister, Ratzeburg, Forstinsekten, Vol. 3, p. 254 (1844).

Rhaphidia major (Burmeister), Albarda, Tijdschr. v. Ent. Vol. 34, p. 95, pl. 3, fig. 3 (1891).

Rhaphidia notata (nec Fabricius), Saint-Fargeau & Serville, Encycl. Méth. Vol. 10, p. 269 (1825).

Rhaphidia notata, Stein, Isis von Oken, p. 99 (1837).

Rhaphidia notata, Brauer & Löw, Neuropt. Austr. p. 53, fig. 100 (1859).

Rhaphidia notata, Hagen, Trans. Ent. Soc. Lond. Vol. 5, p. 498 (1867).

Rhaphidia notata, Burmeister, Handb. Ent. Vol. 2, p. 964 (1839).

Rhaphidia notata, Meyer-Dür, Neuropt. Schweiz, p. 357 (1875).

Rhaphidia laticeps, Wallengren, Skand. Neuropt. Plan. p. 62 (1871).

Rhaphidia laticeps (Wallengren), Brauer, Neuropt. Europa's, p. 15 (1876).

Rhaphidia laticeps (Wallengren), Rostock, Neuropt. germ. p. 114 (1888).

Rhaphidia laticeps (Wallengren), Petersen, Ent. Medd., p. 46 (1906).

Rhaphidia laticeps (Wallengren), Mjöberg, Ent. Tidskr. p. 157 (1909).

18. *R. microstigma*, Stein (1863).

Rhaphidia microstigma, Stein, Berl. Ent. Zeitschr. Vol. 7, p. 417 (1863).

Rhaphidia microstigma (Stein), Albarda, Tijdschr. v. Ent. Vol. 34, p. 108, pl. 4, fig. 8 (1891).

19. *R. notata*, Fabricius (1781). — **Pl. 2, Fig. 2.**

Rhaphidia notata, Fabricius, Spec. Insect. Vol. 1, p. 402 (1781).

Rhaphidia notata, Fabricius, Mant. Insect. Vol. 1, p. 251 (1787).

Rhaphidia notata (Fabricius), Schummel, Versuch. Schles. Art. Gatt. Rhaphidia, p. 13, fig. 3b et 3c (1832).

Rhaphidia notata (Fabricius), Rambur, Hist. nat. Insectes Névropt. p. 436 (1842).

Rhaphidia notata (Fabricius), Mac Lachlan, Brit. Neuropt. Plan. p. 155, pl. 8, fig. 3 (1868).

Rhaphidia notata (Fabricius), Wallengren, Skand. Neur. Plan. p. 61 (1871).

Rhaphidia notata (Fabricius), Brauer, Neuropt. Europa's, p. 15 (1876).

Rhaphidia notata (Fabricius), Rostock, Neuropt. Germ. p. 113 (1888).

Rhaphidia notata (Fabricius), Albarda, Tijdschr. v. Ent. Vol. 34, p. 91, pl. 2, fig. 2 (1891).

Rhaphidia notata (Fabricius), Reuter, Acta Soc. pro Fauna et Flora Fennica, p. 30 (sep. (1894)).

Rhaphidia notata (Fabricius), Petersen, Ent. Medd. (Kobenh.) p. 45 (1906).

Rhaphidia notata (Fabricius), Mjöberg, Ent. Tidskr. p. 157, fig. 40 (1909).

Rhaphidia ophiopsis (nec Linné), Curtis, Brit. Ent. pl. 37 (1824).

Rhaphidia ophiopsis, Stephens, Illustr. Brit. Ent. Vol. 6, p. 130, pl. 31, fig. 1 (1836).

Rhaphidea megacephala, Stephens, ibidem (1836).

Rhaphidia media, Burmeister, Handb. Ent. Vol. 2, p. 964 (1839).

Rhaphidia media, Schneider, Monogr. gen. Rhaphid. p. 76, pl. 4, fig. a-f et pl. 5, fig. a (1843).

Rhaphidia media, Schneider, Stett. Ent. Zeit. p. 252 (1845).

Rhaphidia media, Ratzeburg, Forstinsekten, Vol. 3, p. 254, pl. 16, fig. 5 (1844).

Rhaphidia media, Meyer-Dür, Neur. d. Schweiz, p. 355 (1875).

Rhaphidia media, Hagen, Stett. Ent. Zeit. p. 184 (1844).

Rhaphidia media, Hagen, Trans. Ent. Soc. Lond. Vol. 5, p. 495 (1867).

Rhaphidia media, Brauer & Löw, Neuropt. Austr. p. 53, fig. 101 (1857).

Rhaphidia media, Wallengren, Oefv. Kongl. Vet. Akad. Förhandl. p. 16 (1863).

20. *R. nigricollis*, Albarda (1891).

Rhaphidia nigricollis, Albarda, Tijdschr. v. Ent. Vol. 34, p. 142, pl. 8, fig. 22 (1891).

21. *R. ophiopsis*, Linné (1758). — **Pl. 2, Fig. 4.**

Rhaphidia ophiopsis, Linné, Syst. Nat. (ed. 10), Vol. 1, p. 552 (ex parte) (1758).

Rhaphidia ophiopsis, Linné, Faun. Suec. (ed. 2), p. 385 (ex parte) (1761).

Rhaphidia ophiopsis, Linné, Syst. Nat. (ed. 12), Vol. 1, p. 916 (ex parte) (1767).

Rhaphidia ophiopsis (Linné), Schummel, Versuch. Schles. Art. Gatt. Rhaphidia, p. 10, fig. 1 (1832).

Rhaphidia ophiopsis (Linné), Percheron, Mag. Zool. Vol. 3, n. 66, fig. 3a (1833).

Rhaphidia ophiopsis (Linné), Stein, Isis von Oken, p. 90 (1837).

Greece.

Europe, except the Iberian
and the Balkan penin-
sula.

Frankfurt am Main.

Europe, Mingrélie, Syria,
Caucasus, Mesopotamia.

FAM. RAPHDIDÆ

- Raphidia ophiopsis* (Linné), Rambur, Hist. nat. Ins. Névroptères, p. 439 (1842).
- Raphidia ophiopsis* (Linné), Costa, Faun. Nap. Neur. Rafid. p. 3, pl. 12, fig. 2 (1855).
- Raphidia ophiopsis* (Linné), Brauer & Löw, Neuropt. Austr. p. 53 (1857).
- Raphidia ophiopsis* (Linné), Wallengren, Skand. Neur. Planip. p. 63 (1871).
- Raphidia ophiopsis* (Linné), Hagen, Trans. Ent. Soc. Lond. Vol. 5, p. 494, fig. 1 (1867).
- Raphidia ophiopsis* (Linné), Girard, Traité d'Entom. Vol. 2, p. 504, pl. 64, fig. 2 (1876).
- Raphidia ophiopsis* (Linné), Rostock, Neur. Germ. p. 114 (1888).
- Raphidia ophiopsis* (Linné), Reuter, Acta Soc. pro Faun. et Flor. Fennica, p. 30 (sep.) (1894).
- Raphidia ophiopsis* (Linné), Mjöberg, Ent. Tidskr. p. 158, fig. 41 (1909).
- Rhaphidia ophiopsis* (Linné), Burmeister, Handb. Ent. Vol. 2, p. 963 (1839).
- Rhaphidia ophiopsis* (Linné), Schneider, Monogr. gen. Rhaphid. p. 68, pl. 2, fig. a et b (1843).
- Rhaphidia ophiopsis* (Linné), Ratzeburg, Forstinsekten, Vol. 3, p. 253 (1844).
- Rhaphidia ophiopsis* (Linné), Meyer-Dür, Neuropt. Schweiz, p. 357 (1875).
- Rhaphidia ophiopsis* (Linné), Albarda, Tijdschr. v. Ent. Vol. 34, p. 104, pl. 4, fig. 7 (1891).
22. *R. pilicollis*, Stein (1863). Greece.
- Raphidia pilicollis*, ♀, Stein, Berl. Ent. Zeitschr. p. 415 (1863).
- Rhaphidia pilicollis*, Albarda, Tijdschr. v. Ent. Vol. 34, p. 100, pl. 3, fig. 5 (1891).
- Raphidia pilicollis*, ♂, Klapálek, Bull. intern. Acad. Sciences de Bohême, p. 5 (sep.) (1901).
23. *R. pontica*, Albarda (1891). Asia Minor, Siwas, Amasia, Boz-Dagh.
- Rhaphidia pontica*, Albarda, Tijdschr. v. Ent. Vol. 34, p. 102, pl. 4, fig. 6 (1891).
24. *R. Ratzeburgi*, Brauer (1876). France, Alsace, Switzerland, Saxony, Austria.
- Raphidia Ratzeburgi*, Brauer, Neuropt. Europa's, p. 15 (1876).
- Rhaphidia Ratzeburgi*, Albarda, Tijdschr. v. Ent. Vol. 34, p. 115, pl. 5, fig. 11 (1891).
- Raphidia Schneideri* (nec Ratzeburg), Brauer & Löw, Neuropt. Austr. p. 53 (1857).
- Rhaphidia Schneideri*, Meyer-Dür, Neuropt. Schweiz, p. 356 (1875).
25. *R. rhodopica*, Klapálek (1894). Bulgaria.
- Raphidia rhodopica*, ♂, Klapálek, Trans. Ent. Soc. Lond. p. 489, pl. 10, fig. 1-4 (1894).
26. *R. Schneideri*, Ratzeburg (1844). Pomerania, France, Switzerland, Greece.
- Rhaphidia Schneideri*, Ratzeburg, Fortinsekten, Vol. 3, p. 254 (1844).
- Rhaphidia Schneideri*, Albarda, Tijdschr. v. Ent. Vol. 34, p. 120, pl. 6, fig. 13 (1891).
- Raphidia Schneiderii*, Hagen, Trans. Ent. Soc. Lond. Vol. 5, p. 493, fig. 3 (1867).
- Raphidia xanthostigma*, Girard, Ann. Soc. Ent. France. Vol. 4, p. 6 (1864).
27. *R. sericea*, Albarda (1891). Europe, locality?
- Rhaphidia sericea*, ♀, Albarda, Tijdschr. v. Ent. Vol. 34, p. 122, pl. 6, fig. 14 (1891).
28. *R. taurica*, Hagen (1867). ?
- Raphidia taurica*, Hagen, Trans. Ent. Soc. Lond. Vol. 5, p. 497 (1867).
29. *R. xanthostigma*, Schummel (1832). — **Pl. 2, Fig. 8** (Larva) et **Fig. 9** (Pupa). Europe, Caucasus, Sibiria.
- Raphidia xanthostigma*, Schummel, Versuch, Schles. Art. Gatt. Raphidia, p. 12, fig. 2, a et b (1832).
- Raphidia xanthostigma*, Stein, Isis von Oken, p. 99 (1837).
- Raphidia xanthostigma*, Brauer & Löw, Neuropt. Austr. p. 53 (1857).
- Raphidia xanthostigma*, Wallengren, Skand. Neur. Planip. p. 64 (1871).
- Raphidia xanthostigma*, Hagen, Trans. Ent. Soc. Lond. Vol. 5, p. 495, fig. 2 (1867).
- Raphidia xanthostigma*, Mac Lachlan, Brit. Neur. Planip. p. 157, pl. 8, fig. 4 (1868).
- Raphidia xanthostigma*, Girard, Traité d'Entom. Vol. 2, p. 504 (1876).

- Raphidia xanthostigma*, Rostock, Neur. Germ. p. 114 (1888).
Raphidia xanthostigma, Reuter, Acta Soc. pro Faun. et Flor. Fenn. Vol. 9, p. 30 (1894).
Raphidia xanthostigma, Petersen, Ent. Medd. (Köbenh.) p. 46 (1906).
Raphidia xanthostigma, Mjöberg, Ent. Tidskr. p. 158, fig. 42 (1909).
Rhaphidia xanthostigma, Burmeister, Handb. Entom. Vol. 2, p. 963 (1839).
Rhaphidia xanthostigma, Schneider, Monogr. gen. Rhaphidia, p. 71 (1843) (nec fig. pl. 3 a et b).
Rhaphidia xanthostigma, Ratzelburg, Forstinsekten, Vol. 3, p. 254 (1844).
Rhaphidia xanthostigma, Meyer-Dür, Neur. der Schweiz, p. 356 (1875).
Rhaphidia xanthostigma, Albarda, Tijdschr. v. Ent. Vol. 34, p. 130, pl. 7, fig. 17 (1891).
Raphidia ophiopsis, Linné, Syst. Nat. (ed. 10), Vol. 1, p. 552 (ex parte) (1758).
Raphidia ophiopsis, Linné, Faun. Suec. (ed. 2), p. 385 (ex parte) (1761).
Raphidia ophiopsis, Linné, Syst. Nat. (ed. 12), Vol. 2, p. 916 (ex parte) (1767).
Raphidia ophiopsis, Fabricius, Spec. Ins. Vol. 1, p. 251 (1787).
Raphidia Londinensis, Stephens, Ill. of Brit. Ent. Vol. 6, p. 130 (1836).
Raphidia affinis, Stephens, ibidem (ex parte).
Raphidia confinis, ♀, Stephens, ibidem, p. 131.
Raphidia Schummei, Girard, Ann. Soc. Ent. France, Vol. 4, p. 673 (1864).
Raphidia cognata, Pictet, Neuropt. d'Espagne, pl. 5, fig. 9 (1865).

NEARCTIC SPECIES

30. *R. adnixa*, Hagen (1861). United States.
Raphidia adnixa, Hagen, Synops. Neuropt. North America, p. 195 (1861).
Raphidia adnixa, Banks, Cat. Neuropt. Ins. U. S. p. 22 (1907).
Raphidia adnixa, Banks, Trans. Amer. Ent. Soc. Vol. 37, p. 339, pl. 11, fig. 7 (1911).
Rhaphidia adnixa, Albarda, Tijdschr. v. Ent. Vol. 34, p. 146, pl. 9, fig. 26 (1891).
31. *R. arizonica*, Banks (1911). Arizona.
Raphidia arizonica, Banks, Trans. Amer. Ent. Soc. Vol. 37, p. 338, pl. 11, fig. 8 (1911).
32. *R. assimilis*, Albarda (1891). — **Pl. 2, Fig. 1.** Colorado.
Rhaphidia assimilis, Albarda, Tijdschr. v. Ent. Vol. 34, p. 144, pl. 8, fig. 23 (1911).
Raphidia assimilis, Banks, Cat. Neuropt. Ins. U. S. p. 22 (1907).
Raphidia assimilis, Banks, Trans. Amer. Ent. Soc. Vol. 37, p. 339, pl. 11, fig. 5 (1911).
33. *R. astuta*, Banks (1911). Southern California.
Raphidia astuta, Banks, Trans. Amer. Ent. Soc. Vol. 37, p. 338 (1911).
34. *R. australis*, Banks (1895). Mexico.
Raphidia australis, Banks, Proc. Calif. Acad. Sc. Vol. 2, p. 515 (1895).
35. *R. bicolor*, Albarda (1891). Colorado.
Rhaphidia bicolor, Albarda, Tijdschr. v. Ent. Vol. 34, p. 152, pl. 9, fig. 24 (1891).
Raphidia bicolor, Banks, Cat. Neuropt. Ins. U. S. p. 22 (1907).
Raphidia bicolor, Banks, Trans. Amer. Ent. Soc. Vol. 37, p. 339, pl. 11, fig. 9 (1911).
36. *R. distincta*, Banks (1911). — **Pl. 2, Fig. 11.** California.
Raphidia distincta, Banks, Trans. Amer. Ent. Soc. Vol. 37, p. 338, pl. 11, fig. 1 et 6 (1911).
37. *R. minuta*, Banks (1903). Arizona, New Mexico.
Raphidia minuta, Banks, Proc. Ent. Soc. Wash. Vol. 5, p. 239, pl. 4, fig. 7 (1903).
Raphidia minuta, Banks, Cat. Neuropt. Ins. U. S. p. 22 (1907).
Raphidia minuta, Banks, Trans. Amer. Ent. Soc. Vol. 37, p. 339, pl. 11, fig. 2 et 10 (1911).
38. *R. oblita*, Hagen (1861). — **Pl. 2, Fig. 7.** United States.
Raphidia oblita, Hagen, Syn. Neuropt. North America, p. 195 (1861).
Raphidia oblita, Banks, Cat. Neuropt. U. S. p. 22 (1907).

FAM. RAPHIDIDÆ

- Raphidia oblita*, Banks, Trans. Amer. Ent. Soc. Vol. 37, p. 339, pl. 11, fig. 3 (1911).
Raphidia oblita, Albarda, Tijdschr. v. Ent. Vol. 34, p. 149, pl. 9, fig. 25 (1891).
 39. *R. occulta*, Banks (1905). United States.
Raphidia occulta, Banks, Trans. Amer. Ent. Soc. Vol. 32, p. 4 (1905).
Raphidia occulta, Banks, Cat. Neuropt. Ins. U. S. p. 22 (1907).
Raphidia occulta, Banks, Trans. Amer. Ent. Soc. Vol. 37, p. 339, pl. 11, fig. 4 (1911).

NEOTROPIC SPECIES

40. *R. Herbsti*, Petersen (1912). Chile.
Raphidia Herbsti, ♂, Petersen, Ent. Mitteil. Berlin, p. 273, fig. 7 (1912).

2. GENUS INOCELLIA, SCHNEIDER

Inocellia. Schneider, Monographia generis Raphidiæ Linnæi, p. 32 (1843).

Characters. — No ocelli. Prosternum free. Some of the nervures, running to the apical margin of the wing, are forked there. Pterostigma without cross veins. Two rows of cellules under the upper branch of the media. The genitaliæ of the male not very projecting, hardly visible.

PALEARCTIC SPECIES

1. *I. crassicornis*, Schummel (1832). — Pl. 2, Fig. 3. Sweden, Saxony, Westphalia, Silesia, Hungary, Italy, Syria, Sibiria, Japan.
Raphidia crassicornis, Schummel, Versuch. Schles. Art. Raphidia, p. 15, fig. a, b et c.
Raphidia crassicornis, Percheron, Mag. de Zool. Vol. 3, n. 66, fig. 4 (1833).
Raphidia crassicornis, Stein, Isis von Oken, p. 100 (1837).
Raphidia crassicornis, Burmeister, Handb. Ent. Vol. 2, p. 964 (1839).
Inocellia crassicornis, Schneider, Monogr. gen. Raphid. p. 89, pl. 7 (1843).
Inocellia crassicornis, Costa, Faun. Nap. Neur. Rafid. p. 7, pl. 12, fig. 5 (1855).
Inocellia crassicornis, Brauer & Löw, Neur. Austr. p. 54 (1857).
Inocellia crassicornis, Mac Lachlan, Trans. Ent. Soc. Lond. p. 174 (1875).
Inocellia crassicornis, Girard, Traité d'Ent. Vol. 2, p. 506 (1876).
Inocellia crassicornis, Rostock, Neuropt. Germ. p. 114 (1888).
Inocellia crassicornis, Albarda, Tijdschr. v. Ent. Vol. 34, p. 160, pl. 10, fig. 28 (1891).
Inocellia crassicornis, Borg, Ent. Tidskr. p. 175 (1901).
Inocellia crassicornis, Mjöberg, ibidem, p. 156 (1909).
 2. *I. Braueri*, Albarda (1891). Europe merid. without indication of locality.
Inocellia Braueri, ♀, Albarda, Tijdschr. v. Ent. Vol. 34, p. 165, pl. 11, fig. 30 (1891).
 3. *I. Maclachlani*, Albarda (1891). Sardinia, Corsica.
Inocellia Maclachlani, Albarda, Tijdschr. v. Ent. Vol. 34, p. 162, pl. 10, fig. 29 (1891).
Raphidia crassicornis nec Schummel, Rambur, Hist. nat. Ins. Neuropt. p. 439 (1842).

NEARCTIC SPECIES

4. *I. inflata*, Hagen (1861). United States.
Raphidia inflata, Hagen, Syn. Neuropt. North America, p. 196 (1861).

Inocellia inflata, Albarda, Tijdschr. v. Ent. Vol. 34, p. 167, pl. 11, fig. 31 (1891).

Inocellia inflata, Banks, Cat. Neuropt. U. S. p. 22 (1907).

5. *I. Hageni*, Albarda (1891).

California.

Inocellia Hageni, ♀, Albarda, Tijdschr. v. Ent. Vol. 34, p. 171, pl. 11, fig. 33 (1891).

Inocellia Hageni, Banks, Cat. Neuropt. U. S. p. 22 (1907).

6. *I. longicornis*, Albarda (1891).

California.

Inocellia longicornis, ♂, Albarda, Tijdschr. v. Ent. Vol. 34, p. 169, pl. 11, fig. 32 (1891).

Inocellia longicornis, Banks, Cat. Neuropt. U. S. p. 22 (1907).

INDEX OF GENERA AND SPECIES

(Synonyms in *italics*)

	Pages		Page		Pages		Pa
adanana	6	<i>confinis</i>	7, 10	<i>laticeps</i>	8	ophiopsis	
adnixa	10	<i>corsica</i>	7	<i>ligurica</i>	7	<i>ophiopsis</i>	7, 8, 10
<i>affinis</i>	7, 8, 10	<i>crassicornis</i>	11	<i>londinensis</i>	10		
alloysiana	6	<i>cyprica</i>	7	<i>longicauda</i>	7	pilicollis	9
arizonica	10			<i>longicornis</i>	12	pontica	9
armeniaca	6	<i>distincta</i>	10				
assimilis	10			<i>maclachlani</i>	11	Raphidia	6
astuta	10	<i>etrusca</i>	7	<i>maculicollis</i>	7	ratzeburgi	9
australis	10			<i>major</i>	7	Rhaphidia	6
		<i>flavipes</i>	7	<i>media</i>	8	rhodopica	9
baetica	6			<i>megacephala</i>	8		
<i>baetica</i>	7	<i>hageni</i>	12	<i>microstigma</i>	8	schneideri	9
bavaria	6	<i>harmandi</i>	7	<i>minuta</i>	10	<i>schneideri</i>	9
bicolor	10	<i>herbsti</i>	11	<i>nigricollis</i>	8	<i>schummeli</i>	10
braueri	11	<i>hispanica</i>	7	<i>notata</i>	8	sericea	9
				<i>notata</i>	8		
caucasica	6	<i>inflata</i>	11			taurica	9
cognata	6	Inocellia	11	<i>oblita</i>	10	xanthostigma	9
<i>cognata</i>	10	<i>insularis</i>	7	<i>occulta</i>	11	<i>xanthostigma</i>	7, 9
<i>celubroides</i>	7						

EXPLANATION OF PLATES

PLATE I

Fig. 1. *Raphidia major*, Burmeister, ♀.

— A. *Raphidia xanthostigma*, Schummel.

Aa Labium, seen from below; *Ab* right mandible, seen from above; *Ac* right maxilla, seen from below.

— B. *Raphidia insularis*, Albarda.

Ba Forewing; *Bb* hindwing — *c* = costa; *sc* = subcosta; *r* = radius; *sr* = radial sectors; *m* = media; *cu* = cubitus; *a* = anal veins.

— C. *Raphidia xanthostigma*, Schummel.

Anal parts of ♂, *Ca* seen from below (apical part of penis cut off); *Cb* seen from side.

Anal parts of ♀, *Cc* seen from side (apical part of ovipositor cut off).

— D. *Raphidia xanthostigma*, Schummel.

Da Penis, seen from side; *Db* seen from below.

— E. Larva of *Raphidia* sp.

Ea left mandible, seen from below; *Eb* left maxilla, seen from below; *Ec* labium, seen from below.

PLATE 2

Fig. 1. *Raphidia assimilis*, Albarda, right forewing.

— 2. *Raphidia notata*, Fabricius, ♂.

— 3. *Inocellia crassicornis*, Schummel, ♀.

— 4. *Raphidia ophiopsis*, Linné, left forewing.

— 5. *Raphidia flavipes*, Stein, left forewing.

— 6. *Raphidia baetica*, Rambur, left forewing.

— 7. *Raphidia oblita*, Hagen, left forewing.

— 8. *Raphidia anthostigma*, Schummel, larva.

— 9. *Raphidia xanthostigma*, Schummel, pupa.

— 10. *Raphidia maculicollis*, Stephens, right forewing.

— 11. *Raphidia distincta*, Banks, right forewing.

— 12. *Raphidia Aloysiana*, Costa, right forewing.



SMITHSONIAN INSTITUTION LIBRARIES



3 9088 01270 4136